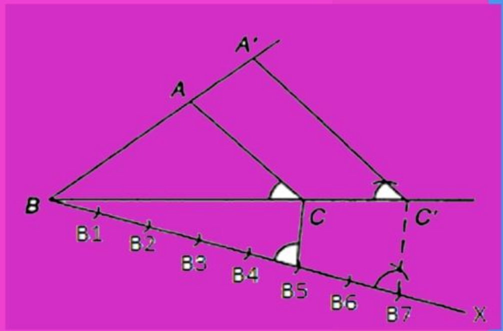
Govt Of Karnataka
Karnataka Residential Educational Institutions Society

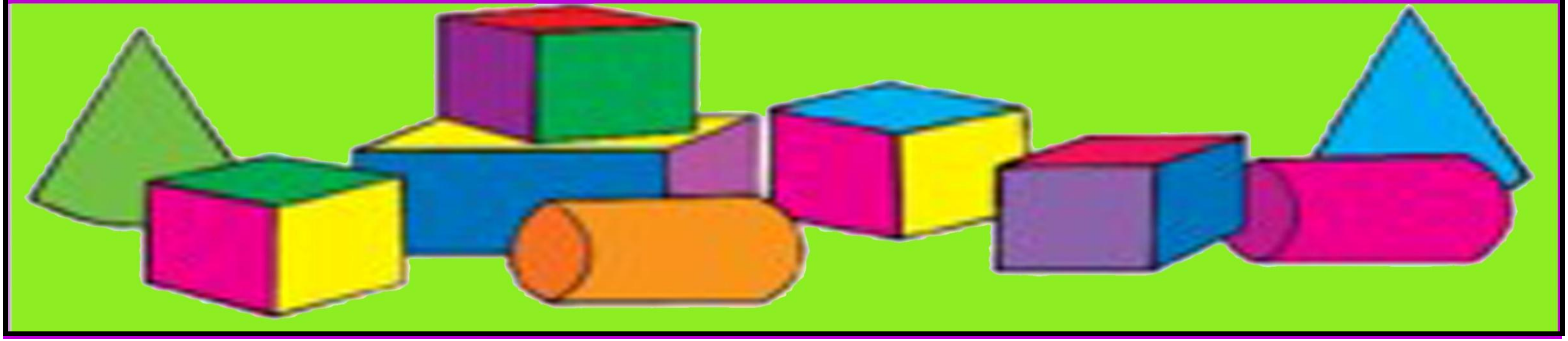
KREIS



class 10

SSLC SUCCESS STEPS

Mathematics



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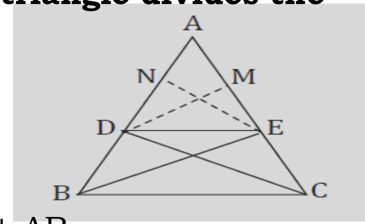
INDEX

THEOREM(7 to 8 marks)

Theorem 1 : Thales Theorem OR Basic Proportionality Theorem

"A line drawn parallel to one side of a triangle divides the other two sides in the same ratio".



Data : In Δ ABC, DE ∥ BC.

To Prove : $\frac{AD}{DB} = \frac{AE}{EC}$

Construction : Draw DM ⊥ AC and EN ⊥ AB.

Proof : $\frac{Area\ of\ \Delta\ ADE}{Area\ of\ \Delta\ BDE} = \frac{\frac{1}{2} \times AD \times EN}{\frac{1}{2} \times DB \times EN} = \frac{AD}{DB}$ -------→ (1)

$\frac{Area\ of\ \Delta\ ADE}{Area\ of\ \Delta\ DEC} = \frac{\frac{1}{2} \times AE \times DM}{\frac{1}{2} \times EC \times DM} = \frac{AE}{EC}$ ----------→ (2)

ΔBDE and ΔDEC stand on the same base DE and between the same parallel lines DE and BC∴.Area of Δ BDE = Area of ΔDEC

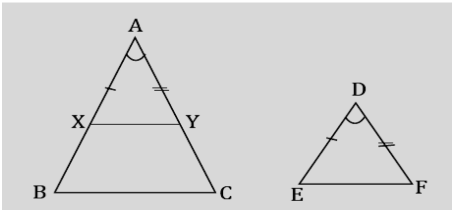
So from equations (1) and (2), we have $\frac{AD}{DB} = \frac{AE}{EC}$. Hence proved.

Theorem 2 (A A Criterion):

"If the corresponding angles of two triangles are equal, then their corresponding sides are in the same ratio"

Data : In Δ ABC and Δ DEF,∠A = ∠D, ∠B = ∠ E and ∠C =∠ F

To Prove : $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$



Construction: Mark the points X and Y on AB and AC such that AX =DE and AY =DF.

Proof : In Δ AXY and Δ DEF,

∠A = ∠D [By data]

AX = DE [By Construction]

AY = DF [By construction] ⇒∴Δ AXY≅ ΔDEF [SAS congruence]

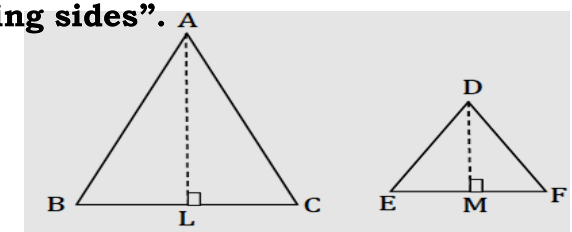
∴ ∠ X= ∠E [CPCT]⇒ ∠B =∠ E. ∴∠X=∠B ⇒XY∥ BC

$\frac{AB}{AX} = \frac{AC}{DF} = \frac{BC}{XY}$ [Corollary of B.P.T]

$\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$ [By Substitution]. Hence proved.

Theorem 3(Areas of Similar Triangles)

"The areas of two similar triangles are proportional to the squares of their corresponding sides".



Data: $\Delta ABC \sim \Delta.DEF$

$\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$

To Prove: $\frac{Area\ of\ \Delta\ ABC}{Area\ of\ \Delta\ DEF} = \frac{BC^2}{EF^2}$

Construction: Draw AL ⊥ BC and DM ⊥ EF.

Proof : $\frac{Area\ of\ \Delta\ ABC}{Area\ of\ \Delta\ DEF} = \frac{\frac{1}{2} \times BC \times AL}{\frac{1}{2} \times EF \times DM} = \frac{BC}{EF} \times \frac{AL}{DM}$----> (1)

In Δ ABL and Δ DEM,∠B =∠ E By data∠L =∠ M [Right angles]

∴$\Delta ABL \sim \Delta\ DEM$ [AA Criterion]

$\frac{AB}{DE} = \frac{BL}{EM} = \frac{AL}{DM}$; But $\frac{AB}{DE} = \frac{BC}{EF}$; $\frac{AB}{DE} = \frac{BC}{EF}$ - ---- - > (2)

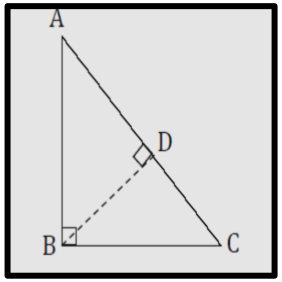
Substitute (2) in (1) $\frac{Area\ of\ \Delta\ ABC}{Area\ of\ \Delta\ DEF} = \frac{BC^2}{EF^2}$ Hence proved.

Theorem 4(Pythagoras Theorem):

"In a right angled triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides"

Data : ABC is a right angled triangle , ∠B = 90^0

To Prove : $AC^2 = AB^2 + BC^2$



Construction : Draw BD ⊥ AC.

Proof : In Δ ABC and Δ ADB,

∠A =∠ A [Common angles]

∠B =∠ D [Right angles]

∴$\Delta ABC \sim \Delta\ ADB$ [AA Criterion]

$\frac{AB}{AD} = \frac{BC}{DB} = \frac{AC}{AB}$ AB^2 = AC × AD-----(1)

Similarly, In Δ ABC and Δ BDC, ∠C =∠ C [Common angles] ∠B =∠ D [Right angles]

∴$\Delta ABC \sim \Delta\ BDC$ [AA Criterion] ⇒$\frac{AB}{BD} = \frac{BC}{DC} = \frac{AC}{BC}$

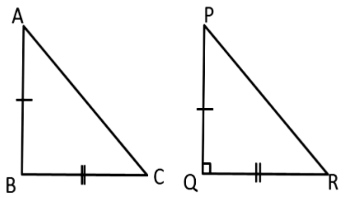
BC^2 = AC × DC------- (2)Adding equations (1)and (2),

$AB^2 + BC^2$ = AC × AD+AC × DC.= AC(AD+ DC)= AC × AC

$AB^2 + BC^2 = AC^2$ Hence proved.

Theorem 5 (Converse of Pythagoras Theorem):

In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.



Data : In a triangle ABC in which $AC^2 = AB^2 + BC2$

To Prove : $\angle B = 90^0$.

Construction: To start with, we construct a Δ PQR right angled at Q such that PQ=AB and QR = BC.

Proof : Now, from ΔPQR, we have : $PR^2 = PQ^2 + QR^2$ (Pythagoras Theorem, as ∠ Q = 90°) or,

$PR^2 = AB^2 + BC^2$ (By construction)------- (1)

But $AC^2 = AB^2 + BC^2$ (Given)-------------- (2)

So, AC = PR ------------(3)

[From (1) and (2)]

Now, in Δ ABC and Δ PQR,

AB = PQ (By construction)

BC = QR (By construction)

AC = PR [Proved in (3) above]

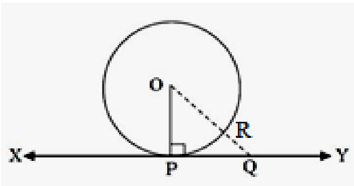
So, Δ ABC ≅ Δ PQR (SSS congruence)

Therefore, ∠ B = ∠ Q (CPCT)

But ∠ Q = 90° (By construction) ⇒So, ∠ B = 90°

Circle theorem 1

"The tangent at any point of a circle is perpendicular to the radius drawn at the point of contact".



Data: O is the centre of the circle .XY is the tangent to the circle at the point P .OP is the radius drawn at the point of contact P.

To Prove : OP ⊥ XY.

Construction : Take a point Q on XY .Join OQ.

Proof : OQ=OR+RQ ⇒OQ=OP+RQ (OP=OR)

⇒ 0Q>0P ⇒∴OQ is longer than OP.

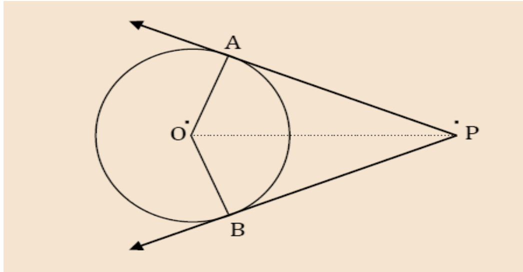
So, OP is the smallest distance of the point O from the line XY.

∴ OP ⊥ XY.

Hence proved.

Circle theorem 2

"The two tangents drawn from an external point to a circle are equal".



Data : O is the centre of the circle .P is an external point . AP and BP are tangents to the circle.

To Prove : AP =BP

Proof : In Δ AOP and Δ BOP,

∠OAP =∠OBP [Right angles]

OA =OB [Radii of the same circle]

OP=OP [Common side]

∴ΔAOP ≅ΔBOP [RHS Theorem]

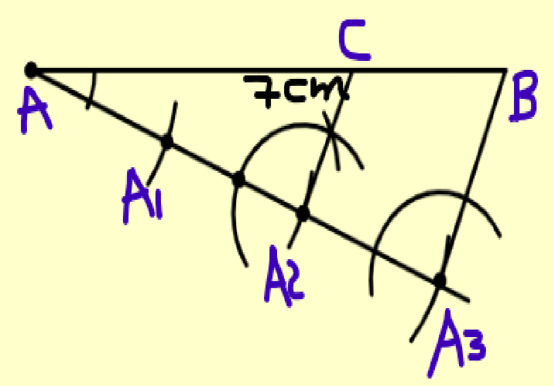
∴ AP=BP [C.P.C.T]

Hence proved.

CONSTRUCTIONS (TARGET 9marks)

TO DIVIDE THE LINE SEGMENT IN THE GIVEN RATIO

1) Draw a line segment of length 7 cm and divide it in the ratio of 2:1



STEPS:
1. Draw a line AB with the measure 7 cm
2. Draw a line AX such that it makes an acute angle.
3. Make 2+1= 3 equal parts on AX.
4. Join last part A_3 to B.
5. Draw a parallel line A_2C to A_3B

AC: CB = 2:1

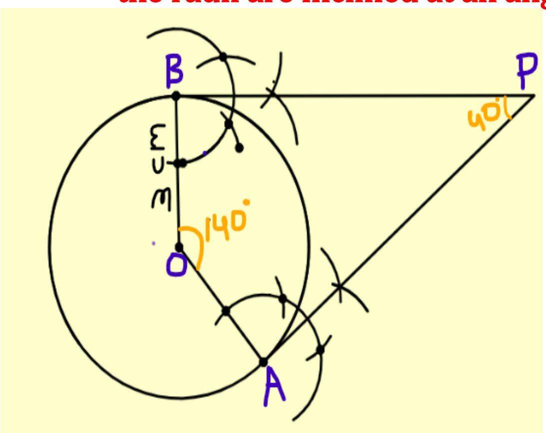
I CAN DO IT

2) Draw a line segment AB of length 8 cm and divide it in the ratio of 3:2.
3) Draw a line segment of length 7.6 cm and divide it in the ratio of 4:2. Measure the two parts.
4) Draw a line segment of length 12 cm and divide it in the ratio of 5:2
5) Draw a line segment of length 9 cm and divide it in the ratio of 3:4

CONSTRUCTION OF TANGENTS TO A CIRCLE

Type 1 : Angle between the radii is given.

1) Draw a pair of tangents to a circle of radius 3 cm, such that the radii are inclined at an angle 140^0.



STEPS :
1) Draw a circle of radius 3 cm.
2) Make an angle of 140^0 between the radii OP and OQ.
3) Draw perpendicular line at P and Q and produce to intersect at R.
4) RP and RQ are the tangents.

RP and RQ are the tangents.

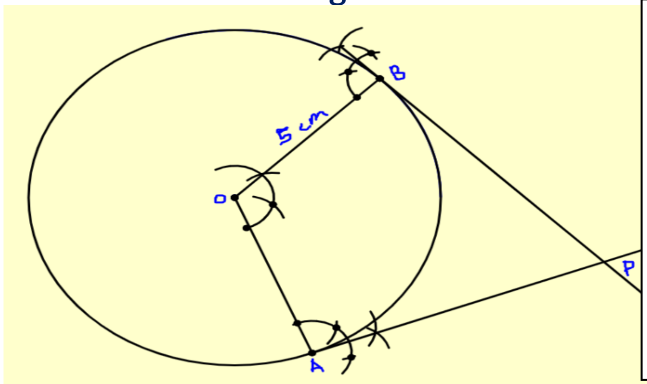
I CAN DO IT

1) Draw a pair of tangents to a circle of radius 5 cm, such that the radii are inclined at an angle 60^0
2) Draw a pair of tangents to a circle of radius 5 cm, such that the radius is inclined at an angle 125^0
3) Draw a pair of tangents to a circle of radius 3.5 cm, such that the radii are inclined at an angle 80^0
4) Draw a pair of tangents to a circle of radius 4 cm, such that the radii are inclined at an angle 75^0 . and write the measure of its length.
5) Draw a pair of tangents to a circle of radius 3 cm, such that the radii are inclined at an angle 70^0.

Type 2 : Angle between the tangents is given.

1) Draw a pair of tangents to a circle of radius 5 cm, which are inclined at an angle of 60^0. Measure the length of the tangents.

Angle between the radii= 180^0-60^0= 120^0



STEPS:
1) Draw a circle of radius 5 cm
2) Make 120^0 between radii OA and OB.
3) Draw perpendicular line at A and B and produce to intersect at P.
4) PA and PB are the tangents

PA and PB are the tangents

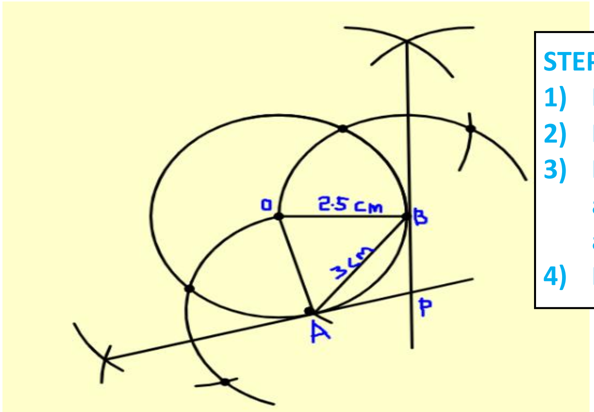
I CAN DO IT

2) Draw a pair of tangents to a circle of radius 3.5cm, such that the angle between the tangents is 90^0
3) Draw a pair of tangents to a circle of radius 4cm, which are inclined at an angle of 120^0
4) Draw a pair of tangents to a circle of radius 3cm, which are inclined at an angle of 60^0
5) Draw a pair of tangents to a circle of radius 3cm, which are inclined at an angle of 70^0

6) Draw a pair of tangents to a circle of radius 3.5 cm, which are inclined at an angle of 80^0
7) Draw a pair of tangents to a circle of diameter 6 cm, which are inclined at an angle of 55^0
8) Draw a pair of tangents to a circle of radius 3.5 cm, which are inclined at an angle of 80^0
9) Draw a pair of tangents to a circle of radius 4 cm, which are inclined at an angle of 100^0
10) Draw a pair of tangents to a circle of radius 5 cm, which are inclined at an angle of 600 . Measure the length of the tangents.

Type 3 : Construction of tangents on the circumference of the circle

1) Draw a circle of radius 2.5 cm and Construct a chord of length 3 cm. and Draw the tangents at the end points of the chord.



STEPS:
1) Draw a circle of radius 2.5 cm
2) Draw a chord AB of length 3 cm
3) Draw perpendicular line at A and B. Produce them to meet at P.
4) PA and PB are the tangents.

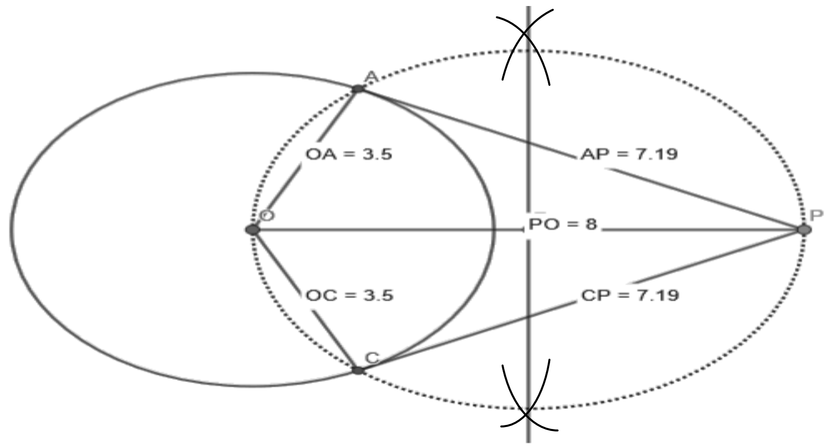
PA and PB are the tangents.

I CAN DO IT

2) Draw a circle of radius 5 cm and Construct a chord of length 7 cm. and Draw the tangents at the end points of the chord.
3) Construct a tangent to a circle of radius 4 cm at any point P on its circumference.
4) Draw a circle of radius 3 cm and draw a diameter AB. Construct the tangents at A and B.
5) Draw a circle of radius 3 cm and Construct a chord AB of length 5 cm. and Draw the tangent at point B.
6) Draw a circle of radius 4.5 cm and Construct a chord PQ of length 7 cm. and Draw the tangent at the point P.

Type 2 : Construction of tangents from an external point.

1. Draw a circle of radius 3.5 cm from a point 8 cm away from the center; construct the pair of tangents to the circle. Measure the tangents and write.



Tangents PA= PB= 7.2 cm

STEPS:
1) Draw a circle of radius 3.5 cm.
2) Draw a line segment OP of length 8 cm.
3) Draw perpendicular bisector of OP
4) With the midpoint of OP as centre draw a circle points O and P on it.
5) Join the intersection points A and B to P.
6) PA and PB are the tangents.

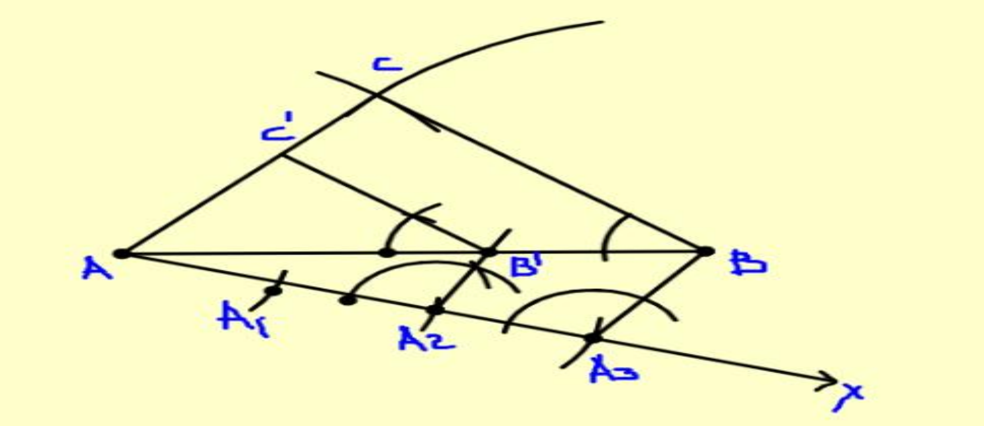
I CAN DO IT

1. Draw a circle of radius 5cm. from a point 5cm away from the circle, construct the pair of tangents to the circle.
2. Draw a circle of radius 4cm. from a point 8cm away from the center, construct the pair of tangents to the circle.
3. Draw a circle of diameter 6 cm. from a point 8cm away from the center, construct the pair of tangents to the circle.
4. Draw a circle of radius 3 cm. Take two points P and Q on one of its extended diameters each at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q.
5. 6)Draw two concentric circles of radii 3 *cm* and 5 *cm*. Taking a point on the outer circle, construct the pair of tangents to the inner circle.
6. Draw two concentric circles of radii 3 *cm* and 5 *cm*. Construct a tangent to smaller circle from a point on the larger circle. Also measure its length.

Construction of Similar Triangles

Type 1: When proper fraction (ratio) given :

1) Construct a triangle of sides 4 cm , 6 cm and 4.5 cm and then a triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.



ΔABC ~Δ AB'C'

STEPS:

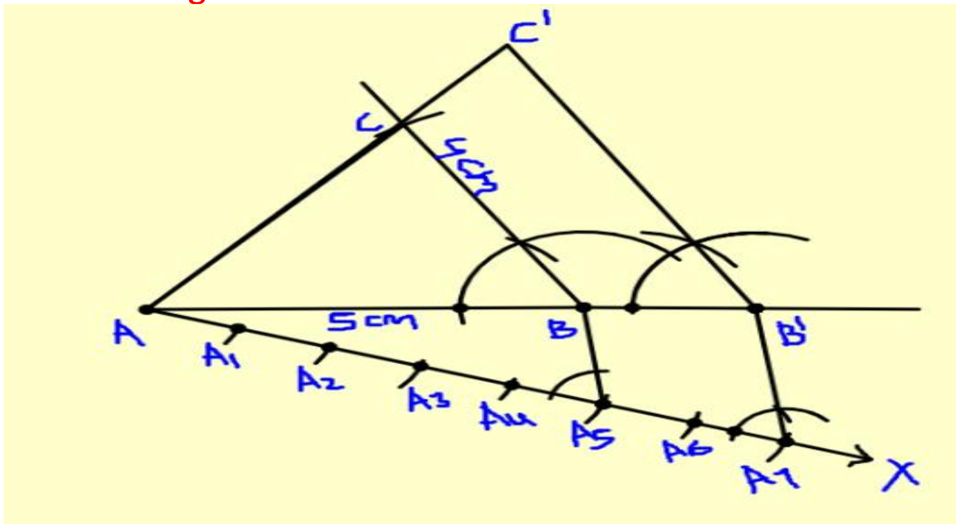
1) Draw a triangle ABC with sides 4 cm, 6 cm and 4.5 cm.
2) Draw AX such that which makes an acute angle.
3) Make equal 3 parts on AX.
4) Join 3rd point ie A_3 to B.
5) Make same measure of angle A3 at 2nd point ie at A_2 Join A_2B'
6) Make same measure of angle B at point B' . Produce C'

I CAN DO IT

1) Construct a triangle of sides 4 cm , 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{2}{5}$ of the corresponding sides of the first triangle.
2) Construct a triangle of sides 4 cm , 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{5}{7}$ of the corresponding sides of the first triangle.
3) Construct a triangle of sides 5 cm , 6 cm and 7 cm and then a triangle similar to it whose sides are $\frac{3}{5}$ of the corresponding sides of the first triangle.
4) Draw a triangle ABC with sides AB = 5 cm, BC =6 cm and ∟ABC=600. Then construct a triangle whose sides are 2:3 of the corresponding sides of triangle ABC.

Type 2: When improper fraction (ratio) given :

1) Draw a triangle ABC with sides AB = 5cm, BC = 4 cm and ∟ABC=60^0 Then construct a triangle whose sides are $\frac{7}{5}$ of the corresponding sides of triangle ABC.



ΔABC ~Δ AB'C'

STEPS:

1) Draw a triangle ABC with AB= 5 cm, BC= 4 cm and ∟ABC=60^0
2) Draw AX such that which makes an acute angle.
3) Make equal 7 parts on AX.
4) Join 5th point ie A_5 to B.
5) Make same measure of angle as A_5 in 7th point ie at A_7. Join A_7B'
6) Make same measure of angle B at point B' and Produce to C'

I CAN DO IT

5) Construct a triangle of sides 5 cm , 6 cm and 7 cm and then a triangle similar to it whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle.
6) Draw a triangle ABC with sides AB = 6cm, BC =5cm and ∟ABC=80^0 . Then construct a triangle whose sides are $\frac{4}{3}$of the corresponding sides of triangle ABC.

7) Construct a triangle ABC with sides AB= 6cm and $\angle BAC=50^0$ and $\angle ABC=60^0$. Then construct a triangle whose sides are $1\frac{1}{2}$ of the corresponding sides triangle ABC.

8) Construct a triangle ABC with sides BC= 4.5cm and AB= 5.5 cm and $\angle A=55^0$. Then construct a triangle whose sides are $\frac{5}{2}$ the corresponding sides of triangle ABC.

9) Draw a right triangle in which the sides (other than hypotenuse) are of lengths 8 cm and 6 cm, then construct another triangle whose sides are $\frac{5}{3}$ of times the corresponding sides of the given triangle.

10) Draw a triangle ABC with side base BC= 8 cm and altitude 4 cm, and then construct another triangle whose sides are $\frac{5}{3}$ times the corresponding sides of the isosceles triangle ABC.

11) Draw a right triangle in which the sides (other than hypotenuse) are of lengths 4 cm and 3 cm, then construct another triangle whose sides are $\frac{5}{3}$ of times the corresponding sides of the given triangle.

12) Construct a triangle of sides 4 cm , 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{5}{3}$ of the corresponding sides of the first triangle.

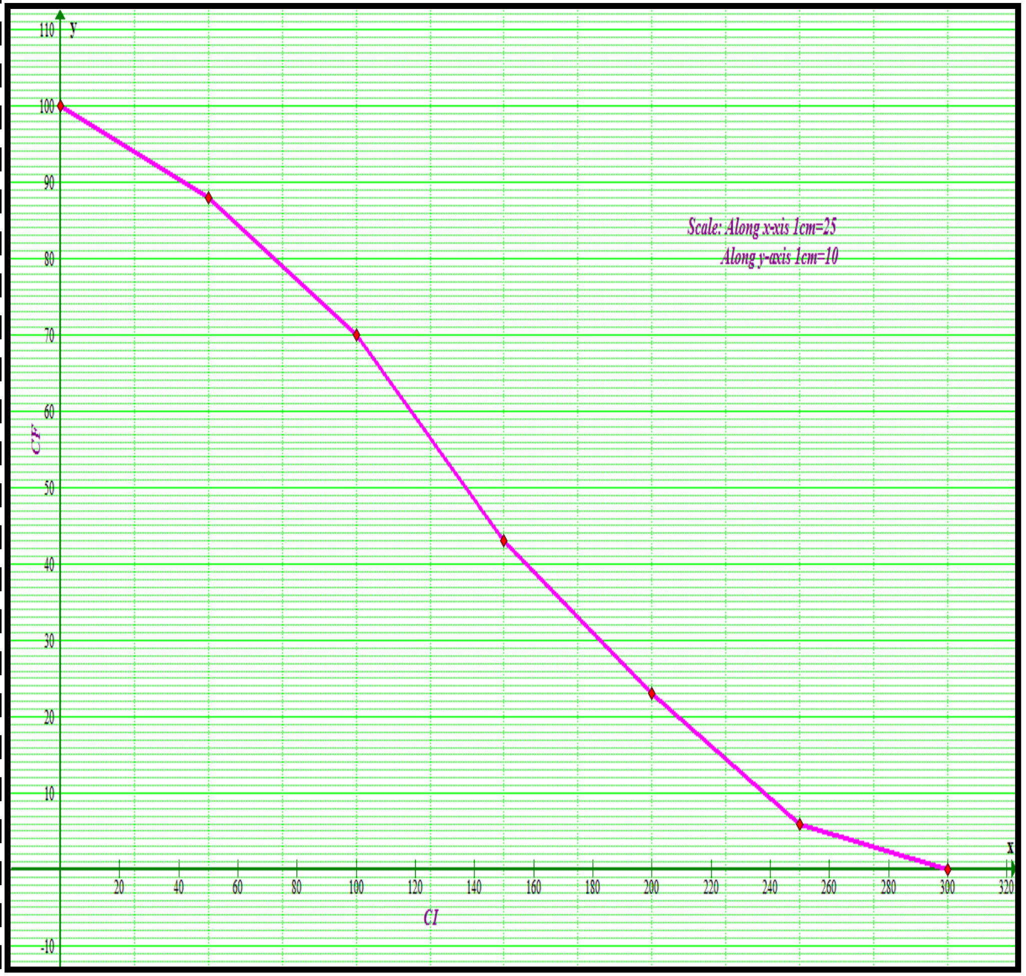
Ogive Curve: (Target-3marks)

1. Draw more than ogive curve for following data.

CI	0-50	50-100	100-150	150-200	200-250	250-300
f	12	18	27	20	17	6

It should be converted like this.

CI	F	CI	f	(x,y)
0-50	12	More than 0	100	(0,100)
50-100	18	More than 50	88	(50,88)
100-150	27	More than 100	70	(100,70)
150-200	20	More than 150	43	(150,43)
200-250	17	More than 200	23	(200,23)
250-300	6	More than 250	6	(250,6)



Dear students this question can also be asked like this.

CI	More than 0	More than 50	More than 100	More than 150	More than 200	More than 250	More than 300
CF	100	88	70	43	23	6	0

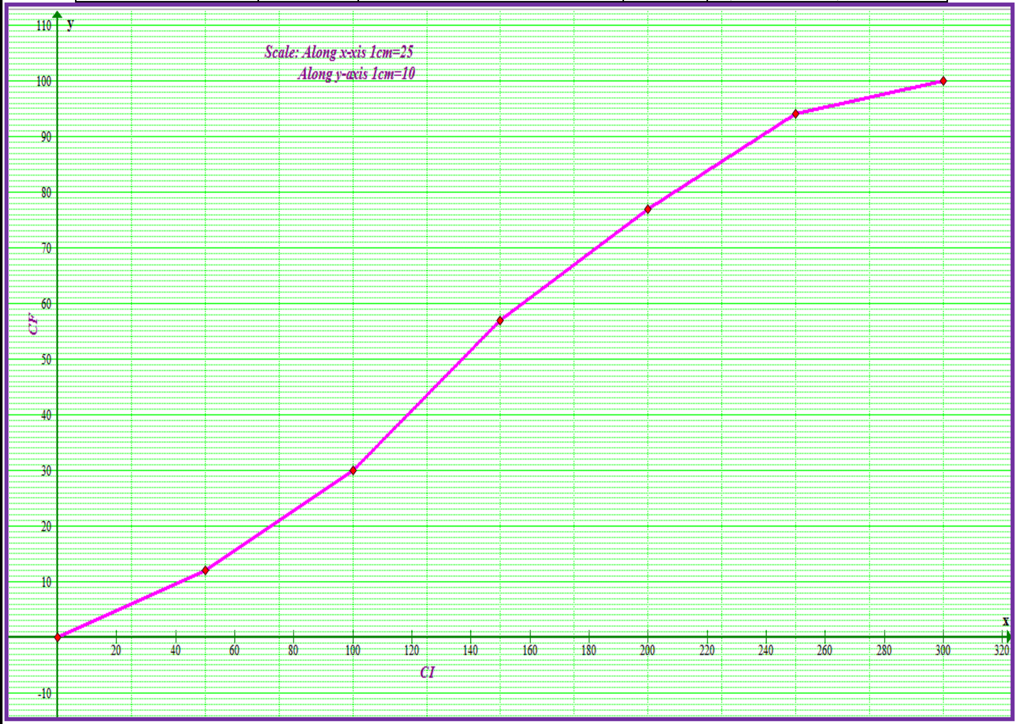
If they given question like this then you can plot graph directly.

2.Same question for less than type draw more than ogive curve for following data.

CI	0-50	50-100	100-150	150-200	200-250	250-300
F	12	18	27	20	17	6

It should be converted like this.

CI	F	CI	f	(x,y)
0-50	12	less than 50	12	(50,12)
50-100	18	less than 100	30	(100,30)
100-150	27	less than 150	57	(150,57)
150-200	20	less than 200	77	(200,77)
200-250	17	less than 250	94	(250,94)
250-300	6	less than 300	100	(300,100)

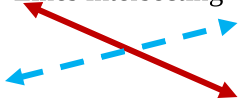
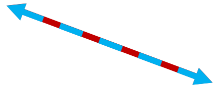
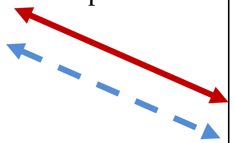


Dear students this question can also be asked like this.

CI	Less than 0	less than 50	less than 100	less than 150	less than 200	less than 250	less than 300
CF	0	12	30	57	77	94	100

Pair of Linear Equation in two variables

Step:1 To get 1mark study this table:($a_1x+b_1y=c_1$:$a_2x+b_2y=c_2$)

Sl.No	Compare the ratio	Graphical Representation	Algebraic Interpretation	Consistency
1.	$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	Lines intersecting 	Only one solution i.e(unique solution)	Consistent
2.	$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Lines are coincident 	Many solution i.e(infinite solution)	Dependent and consistent.
3.	$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	Lines are parallel 	No solution (Zero solution)	Inconsistent

Step:2 To get 2mark

(Solve these linear equation by elimination method):

Type 1.Solve x+3y=6 and 2x-3y=6.

Solution: x+3y=6-------(1) 2x -3y=6-------(2)

Adding these we get

x +3y=6

2x - 3y=6

3x+(0)y=12 3x=12 ⇒ $x=\frac{12}{3}$;x=4 => consider (1) x+3y=6 =>4+3y=6

⇨ 3y=6-4=2 ⇒$y=\frac{2}{3}$; So x=4 and $y=\frac{2}{3}$ are the solution.

Type 2. Solve 2x+y-6=0 and 6x+2y-4=0.

Solution: 2x+ y-6=0 => 2x+ y=6-------(1)

6x+2y-4=0 => 6x+2y=4-------(2) Here we eliminate y-coordinate. To eliminate y we need to multiply (1) by 2 and subtract.

4x+ 2y= 12-------(1)

6x+ 2y= 4-------(2)

(-) (-) =(-)

-2x=8 => $x=\frac{8}{-2}$= - 4 x= - 4 ; substitute in (1) 2x+y=6

=> 2(-4)+y=6 =>-8+y=6 => y=6+8 =>y=14 So x=-4; y=14 are the solution.

Type 3: Solve 3x+4y=2 and 2x-3y=7.

Solution: 3x+4y=2 - - - - - - - -(1)

2x-3y=7 - - - - - - - -(2)

Here both x and y have different coefficients in equations (1) and (2). So make the coefficient of any of the variable (either x or y) to be same in both equations. Multiply equation (1) by 2(co efficient of x in (2)) and equation (2) by 3(co efficient of x in (1)).

$\Rightarrow$ 6x+8y=4

6x-9y=21

On subtraction 17y = -17

$\Rightarrow$ y = -1

Now substitute y= -1 in equation (1), we get

3x+4(-1) =2 $\Rightarrow$ 3x -4 = 2 $\Rightarrow$ 3x = 2 + 4

3x = 6 $\therefore$ x = 2 $\therefore$ The solutions are x= 2 and y = -1.

Solve the following for X and Y:

I CAN DO IT

Step3: Graphical solution of pair of linear equation by getting perfect you will get 4marks in your exam:

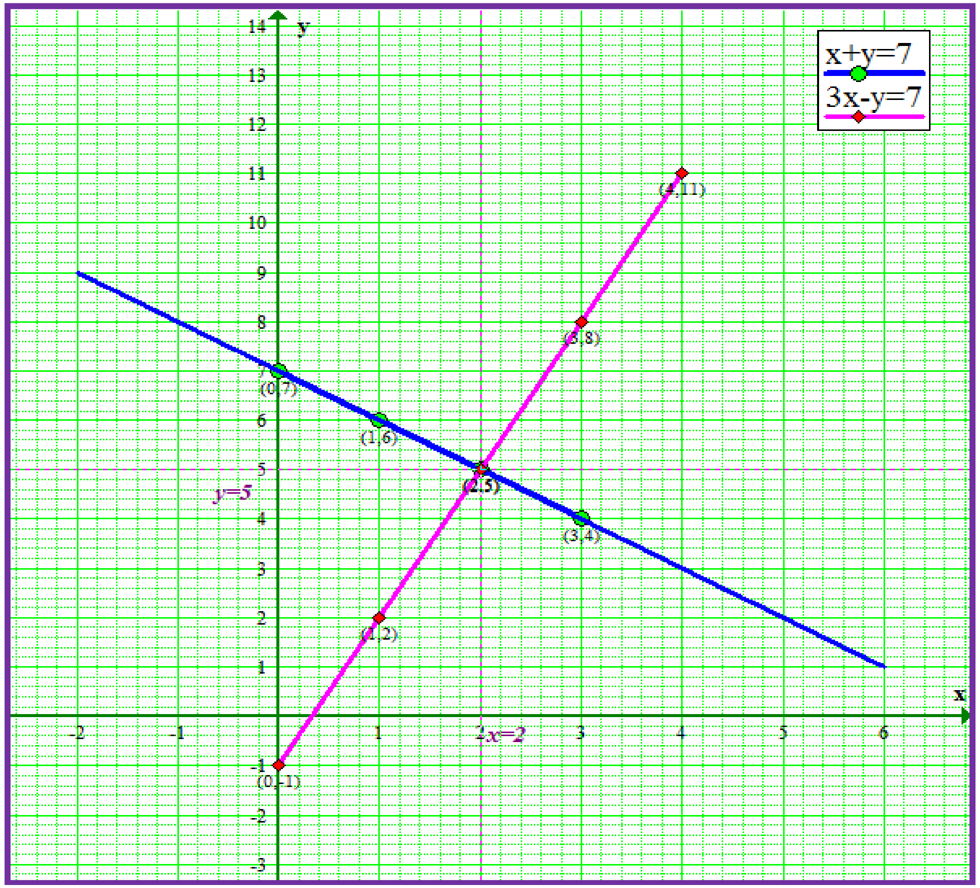
1.Solve the following pair of linear equations in two variables by graphical method :x + y = 7 and 3x – y = 1

Solution:x+y=7

x	0	1	2	3
y	7	6	5	4

3x-y=1

x	0	1	2	3	4
y	-1	2	5	8	11



Here lines intersect at(2,5) so solution is x=2 and y=5.

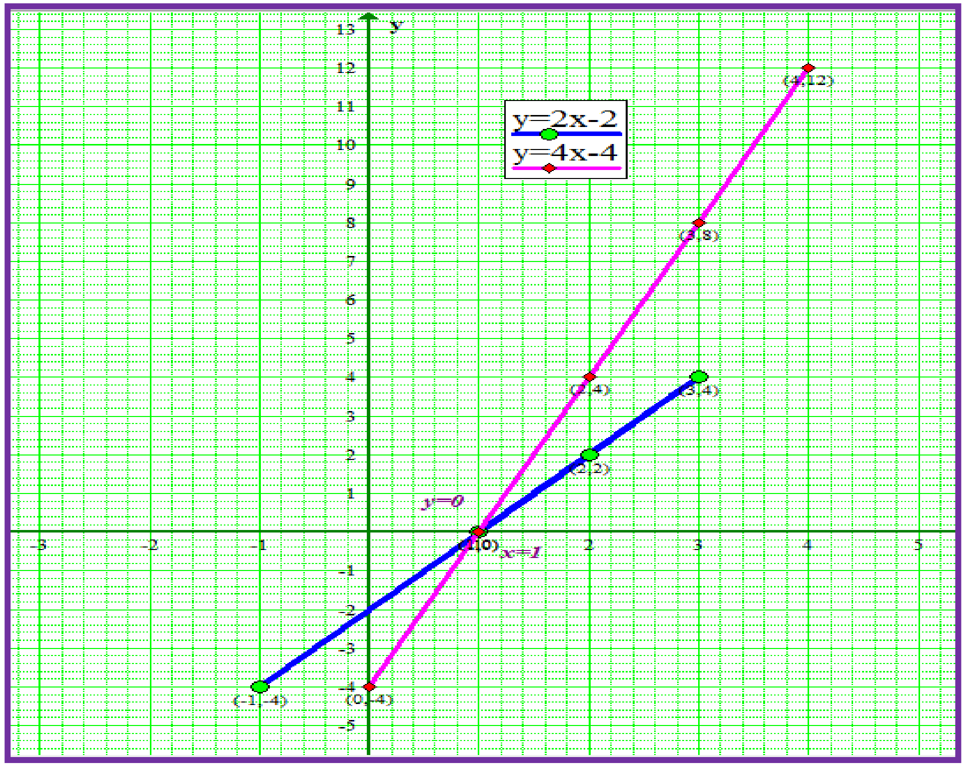
2.Solve the following pair of linear equations in two variables by graphical method :y =2x-2 and y =4x-4

Solution: y=2x-2

x	-1	1	2	3
y	-4	0	2	4

y=4x-4

x	0	1	2	3	4
y	-4	0	4	8	12



Here lines intersect at (1,0) so solution is x=1 and y=0

For practice: Solve these questions by elimination method and also solve by graphical method.*

1.3x+2y=1;5x-3y=2	**2.5x-3y=2;4x-y=1**	**3.2x+3y=2;3x-1=4y**	**4.5x+y=1;x-y=8**
5.3x+2=y; y-3=4x	6.5x+y=7;x-3y=5	7.y-x=2; 2x-y=-2	8.3x+y=7; 4x-y=2
9.3x+2y=5;5x-3y=1	10.3x-y=7;x+3y=5	11.4x-y=3; 3x-2y=1	12.2x-y=7; x-3=4y
13.3x+5y=4;x-5y=8	14.y-x+2=0;x-2y-4=0	15.2x+y=3;x+3y=-10	16.y=2x-2; y=4x-4
17.x-y=4; x+y=10	18.2x-y-2=0; x+y=6	19.x+y=10;x-y=2	20.2x+y=8;x+2y=7

*** Solve daily one problem from above on elimination method and graphical method to get 6m.**

Mean, Median and Mode : (Target-3marks)

Mean: Mean is the ratio of sum of all observations to the total number of observations.

Median : The middle most observation in an orderly arranged data distribution is called Median.

Mode: The most repeated observation in a data distribution is called Mode.

Formulae to find mean, median and mode:

1) **Mean** = $\frac{\sum fx}{\sum f}$ where 'f ' is frequency and 'x ' is class mark of class interval

2) Median = $l+\left[\frac{\frac{n}{2}-cf}{f}\right]\times h$ where

l – Lower limit of median class n- Number of observations h – Class size
cf – Cumulative frequency of class preceding the median class
f- Frequency of median class.

Mode = $l+\left[\frac{f_1-f_0}{2f_1-f_0-f_2}\right]\times h$ where,

l – Lower limit of the modal class h – Class size
f_1- Frequency of modal class f_0- Frequency of class preceding modal class
f_2 – Frequency of class succeeding modal class.

Example 1): Calculate mean, median and mode for the following data distribution.

C-I	0-10	10-20	20-30	30-40	40-50
F	6	8	7	3	1

Solution: To find mean

C-I	**f**	**X**	**fx**
0-10	6	5	30
10-20	8	15	120
20-30	7	25	175
30-40	3	35	105
40-50	1	45	45

$\therefore$ **Mean** $\bar{x}=\frac{\sum fx}{\sum f}$

$=\frac{475}{25}$

= 19.

$\sum f = 25 \quad \sum fx = 475$

To find median,

C-I	f	Cf
0-10	6	6
10-20	8	14
20-30	7	21
30-40	3	24
40-50	1	25

Here 'n' is odd so consider $(\frac{n+1}{2})^{th}$ observation.

$\left(\frac{n+1}{2}\right)=\left(\frac{25+1}{2}\right)=\left(\frac{26}{2}\right)=13^{th}$ observation exists in the class interval (10-20). (By observing cf column, we can find it).

∴ **(10-20)** is median class.

Here, Lower limit of median **l= 10**

Number of observations **n =25**

Cf of class preceding median class **cf = 6**

Frequency of median class **f = 8** and Class size **h = 10.** **n=25**

∴ **Median=** $l+\left[\frac{\frac{n}{2}-cf}{f}\right]\times h$ = $10+\left[\frac{\frac{25}{2}-6}{8}\right]\times 10$ = $10+\left[\frac{12.5-6}{8}\right]\times 10$

= $10+\left[\frac{6.5}{8}\right]\times 10$ =10 + 8.125 ∴ **Median =18.125**

To find Mode,

C-I	F
0-10	6
10-20	8
20-30	7
30-40	3
40-50	1

Here the class **(10-20)** has the highest frequency '8' so it is called modal class.

∴ Lower limit of modal class **l =10**

Size of class interval **h= 10**

Frequency of modal class $\mathbf{f_1 = 8}$

Frequency of class preceding modal class $\mathbf{f_0 = 6}$

Frequency of class succeeding modal class $\mathbf{f_2 = 7}$

∴ **Mode =** $l+\left[\frac{f_1-f_0}{2f_1-f_0-f_2}\right]\times h$

$= 10+\left[\frac{8-6}{2(8)-6-7}\right]\times 10 \quad = 10+\left[\frac{2}{16-13}\right]\times 10 \quad = 10+\left[\frac{2}{3}\right]\times 10 \quad =$

10 +6.66 =**16.66**

Note: 1) If two class intervals have highest frequencies then we have to find mode for both class intervals.

2) If the first class interval has highest frequency then $f_0 = 0$

3) If the last class interval has highest frequency then $f_2 = 0$

If they given question like this then you can plot graph directly.

I CAN DO IT

For practice: Find mean, median, mode and draw less than and more than ogive curve for the following data. (To achieve 3m for mean,median and mode) and 3m for ogive. *

C-I	0-10	10-20	20-30	30-40	40-50
F	4	3	5	2	1

C –I	0-5	5-10	10-15	15-20	20-25	25-30
F	5	7	6	5	3	4

C-I	0-5	5-10	10-15	15-20	20-25
F	4	3	5	6	2

C-I	1-3	3-5	5-7	7-9	9-11
F	7	8	2	2	1

C-I	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
F	3	8	9	10	3	0	0	2

C-I	500-520	520-540	540-560	560-580	580-600
F	12	14	8	6	10

C-I	11-13	13-15	15-17	17-19	19-21	21-23	23-25
F	7	6	9	13	20	5	4

C-I	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
F	5	3	4	3	3	4	7	9	7	8

C-I	0-5	5-10	10-15	15-20	20-25
F	4	6	3	2	5

C-I	0-100	100-200	200-300	300-400	400-500
F	15	10	17	12	6

Answers:

1) **Mean = 20.33** **Median = 21** **Mode = 24**
2) **Mean = 13.5** **Median = 12.5** **Mode = 8.33**
3) **Mean = 12.25** **Median = 13** **Mode = 16**
4) **Mean = 4.2** **Median = 3.75** **Mode = 3.28**

5) Mean = 33.71 Median = 28.61 Mode = 30.27
6) Mean = 545.2 Median = 538.33 Mode = 525
7) Mean = 18 Median = 18.53 Mode = 19.63
8) Mean = 59.15 Median = 66.42 Mode = 75
9) Mean = 12 Median = 10 Mode = 7
10) Mean = 223.33 Median = 229.41 Mode = 258.33

*Practice all above you will get definitely 6marks.

QUADRATIC EQUATIONS

1) Solving quadratic equations by formula method:

Ex:1) $x^2+10x+25=0$

Solution: Given $x^2+10x+24=0$

Here a=1, b=10 and c=24

$$\therefore x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$= \frac{-10 \pm \sqrt{(10)^2-4(1)(24)}}{2(1)} = \frac{-10 \pm \sqrt{100-96}}{2}$$

$$= \frac{-10 \pm \sqrt{4}}{2} = \frac{-10 \pm 2}{2}$$

$$= \frac{-10+2}{2} \text{ or } = \frac{-10-2}{2}$$

$$= \frac{-8}{2} \text{ or } = \frac{-12}{2}$$

$$=-4 \text{ or } = -6$$

1. For practice:

2. $x^2-7x+12=0$
3. $x^2-8x+9=0$
4. $x^2-4x+5=0$
5. $x^2-10x+13=0$
6. $m^2-8m+10=0$
7. $4x^2-5+2x=0$
8. $3x^2-5x+2=0$
9. $2x^2-3x-8=0$
10. $x^2+3x=1$
11. $4x^2-5=6x$

11. $x^2+5x-3=0$
12. $x^2-6x+8=0$
13. $x^2+4x-5=0$
14. $y^2-8y+10=0$
15. $x^2-5a+6=0$
16. $7x^2+3x-5=0$
17. $5x^2-7x+12=0$
18. $X^2=8x-5$
19. $4x^2-1=8$
20. $3x^2+1=8x$

2. Find the nature of the roots of the following equations:

1. $x^2-7x+12=0$
2. $x^2-8x+9=0$
3. $x^2-4x+5=0$
4. $x^2-10x+13=0$
5. $m^2-8m+10=0$
6. $4x^2-5+2x=0$
7. $3x^2-5x+2=0$
8. $2x^2-3x-8=0$
9. $x^2+3x=1$
10. $4x^2-5=6x$
11. $x^2+5x-3=0$
12. $x^2-6x+8=0$
13. $x^2+4x-5=0$
14. $y^2-8y+10=0$
15. $x^2-5a+6=0$
16. $7x^2+3x-5=0$
17. $5x^2-7x+12=0$
18. $x^2=8x-5$
19. $4x^2-1=8$
20. $3x^2+1=8x$

3. If the roots of the following quadratic equations are equal, then find the value of 'k'.

1) $x^2+kx+4=0$
2) $x^2+8x-k=0$
3) $4x^2+kx+25=0$
4) $Kx^2+10x+25=0$
5) $2x^2+kx+5=0$
6) $X^2-kx+64=0$
7) $X^2+10x+k=0$
8) $Kx^2-12x+4=0$
9) $X^2+kx+10=0$
10) $X^2+5x+k=0$
11) $x^2+6x+k=0$
12) $x^2-12x+k=0$
13) $25X^2-kx+9=0$
14) $kx^2-14x+49=0$
15) $x^2-5x+k=0$
16) $x^2+kx+81=0$
17) $x^2-10x+k=0$
18) $kx^2-36x+4=0$
19) $x^2-kx+20=0$
20) $x^2-kx+100=0$

CO-ORDINATE GEOMETRY:

1) Find the distance of a point (4, -3) from the origin.(1m)

Solution: We know that formula for distance from origin is

$d=\sqrt{x^2+y^2}=\sqrt{(4)^2+(-3)^2}$

$d=\sqrt{16+9}$ $d=\sqrt{25}$ d=5 units

I CAN DO IT

1.Find the distance of a point (2, -3) from the origin.
2.Find the distance of a point (-6, -8) from the origin.
3.Find the distance of a point (-5, 12) from the origin.
4.Find the distance of a point (7, -24) from the origin.
5.Find the length of diameter of a circle whose centre is (-4, 3) which passes through the origin.

2) Find the distance between the points (2, 4)and (5, 8).(2m)

Solution: We know that formula for distance from origin is

$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}=\sqrt{(2-5)^2+(4-8)^2}$

$d=\sqrt{(-3)^2+(-4)^2}$ $d=\sqrt{9+16}$

$d=\sqrt{25}$ =>d=5 units

I CAN DO IT

1.Find the distance between the points (-3, 5)and (3, -3).
2.Find the distance between the points (-7, 5)and (6, 3)
3.Find the distance between the points (-12, 5)and (13, 5)
4.Find the distance between the points (-1, 5)and (6, 5)
5.Find the distance between the points (-6, 5)and (8, 5)

3) Find the perimeter of triangle whose vertices are (5, 2), (-3, 4) and (2, -5). (3m)

Solution:

$x_1=5, x_2=-3, x_3=2, y_1=2, y_2=4, y_3=-5$

Area of triangle$=\frac{1}{2}[x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)]$

$=\frac{1}{2}[5(4-(-5))+(-3)((-5)-2)+2(2-4)]$

$=\frac{1}{2}[5(4+5)-3(-5-2)+2(2-4)]$

$=\frac{1}{2}[5x9+3x7+2x(-2)]$

$=\frac{1}{2}[45+21-4]$

$=\frac{1}{2}[62]$

=31 square units

4) Find the type of triangle whose vertices are,

i)(1, 0), (-4, -2) and (4, -2) ii)(2, 6),(-2, 3) and (6, 3)
iii)(4, 9), (4, 3) and (8, 6) iv)(4, -5), (-3, -7) and (4, -7)
v)(-5, 6), (-10, 3) and (-6, 3)

5) Find the areas of triangles whose vertices are given below.

1.(2, -1) , (3, 2) and (5, -3) 6) (3, 0) , (-2, -3) and (5, -2)
2.(-3, 1) , (-4, -3) and (2, 1) 7) (5, -3) , (2, -5) and (-3, 4)
3.(-2, 1) , (4, 5) and (-1, -4) 8) (-1, -4) , (-5, -6) and (3, 2)
4.(5, 6) , (3, -7) and (-3, -5) 9) (-6, -3), (-8, -1) and (1, 0)
5.(3, 2) , (5, -1) and (4, 0) 10) (0, 8), (-8, 0) and (0, 0)

6) Find the perimeters of triangles whose vertices are given below.

i)(1, 0), (-4, -2) and (4, -2) ii)(2, 6),(-2, 3) and (6, 3)
iii)(4, 9), (4, 3) and (8, 6) iv)(4, -5), (-3, -7) and (4, -7)
v)(-5, 6), (-10, 3) and (-6, 3)

7) Find the value of 'k' if the given points are collinear.

1) (4, k) (3, -2) and (2, 1) 6) (3, k) , (-2, -3) and (5, -2
2) (-1, 2), (-3, 4)and (k, 1) 7) (5, -3), (4, k) and (7, -2)
3) (3, 1), (5 -2) and (2, -k) 8) (k, -3), (6, 5) and (4, 8)
4) (k, 2), (3, -1) and (5, 2) 9) (-3, -5), (-4, 5) and (0, k)
5) (-1, -3), (k, -3) and (1, 2) 10) (6, k), (k, 2) and (-2, -3)

Arithmetic progressions

Find a_n for the following.

1) In an A.P.If a=5, d=3, then find 10th term.

Solution: Given a=5, d=3

W.K.T. $a_n=a+(n-1)d$

$\therefore a_{10}=5+(10-1)(3)$

$\therefore a_{10}=5+(9)(3)$ $\therefore a_{10}=5+27=32$

$\therefore$ **The 10th term of the A.P. is 32.**

For practice:

1. a=3, d=2, a_{15}=? 3. a= -2, d=5, a_{10}=?
2. a=4, d=3, a_{20}=? 4. a=-1, d= -3, a_{40}=?

Find number of terms for the following.

1. 2, 5, 8,………98 5. 8, 4, 0,………..-48
2. 1, 4, 7, ………100 6. 12, 7, 5, ……..-138
3. 10, 4, 7,………-47 7. 1, 5, 9, ………57
4. -3, -8, -13,……..-98 8. 3, 5, 7, ……..99

Find the A.P. for the following.

1. a_{12}=35, a_{18}=53 find a_{20}.
2. a_{13}=37, a_{17}=49 find a_{15}.
3. a_5=-23, a_{15}=-73 find a_{25}.
4. a_{22}= -76, a_{30}= -108 find a_{50}.
5. a_{32}=65, a_{40}=81 find a_{26}.
6. a_8= -15, a_{15}=-29 find a_{12}.
7. a_7=15, a_{16}=42 find a_{20}.
8. a_5= -28, a_{10}= -58 find a_{30}.

Find S_n for the following.

Ex:1) Find the sum of A.P. 1+5+9+ ……….. upto 20 terms.

Solution: Given A.P. is 1+5+9+………… upto 20 terms

$\therefore$ **a=1, d=4, n=20, S_n=?**

W.K.T. $S_n = \frac{n}{2}[2a+(n-1)d]$

$$\therefore S_{20} = \frac{20}{2}[2(1)+(20-1)(4)]$$

$\therefore S_{20} = 10[2+(19)(4)]$ $\therefore S_{20} = 10(2+76) = 10(78)=$**780.**

$\therefore$ **The sum of first 20 terms is 780.**

For practice:

1.2+5+8+…………upto 20 terms.
2.1+4+7+…………upto 30 terms.
3.6+4+2+…………upto 25 terms.
4.-3-1+1+3+………upto 15 terms.
5.10+6+2+………upto 12 terms.
6. 3+5+7+ ………..+45.
7. 3+8+13+………..+63.
8. 7+12+17+………+87.
9. 4+9+14+………+104.
10.5+3+1+…..........+(-33).
6.Find the sum of first 20 natural numbers.
7. Find the sum of first 30 natural numbers.
8. Find the sum of first 15 odd numbers.
9. Find the sum of first 25 odd numbers.
10. Find the sum of first 12 even numbers.
11. Find the sum of first 18 even numbers.

COMPLEMENTARY RATIOS

1. Evaluate the following.

1. $\frac{\sin 23^0}{\cos 67^0}$ 2. $\frac{\cos ec42^0}{\sec 48^0}$ 3. $\frac{\tan 36^0}{\cot 54^0}$ 4.$\sin 54^0 - \cos 36^0$

5.$\tan 62^0 - \cot 28^0$ 6. $\text{cosec}15^0 - \sec 75^0$

7. $\sin 26^0 + \text{cosec}42^0 - \sec 48^0 - \cos 64^0$ 8. $\frac{2\cos ec64 + \sec 26}{2\sec 26 + \cos ec64}$

9. $\frac{3\tan 44 - 2\cot 46}{5\cot 46 + 2\tan 44}$ 10. $\frac{3\sin 50 - 2\cos 40}{5\cos 50 - 4\sin 40} + \frac{3\cos 50 - 4\sin 40}{2\cos 40 - \sin 50}$

TRIGONOMETRY

1. One mark questions

1. If $\sin\theta = \frac{3}{5}$ find all trigonometric ratios.
2. If $\cot\theta = \frac{12}{5}$ find all trigonometric ratios.
3. If $\sec\theta = \frac{7}{3}$ find all trigonometric ratios.
4. If $\cos\theta = \frac{5}{8}$ find all trigonometric ratios.
5. Express $\tan\theta$ in terms of all trigonometric ratios.

Express cosecθ in terms of all trigonometric ratios

2. Standard Angles: Evaluate the following.

Ex: 1) Evaluate $\frac{2\tan 45 + 3\sin 30}{2\text{cosec}30 - \sec 60}$

Solution: $\frac{2\tan 45 + 3\sin 30}{2\cos ec30 - \sec 60} = \frac{2(1)+3(\frac{1}{2})}{2(2)-2} = \frac{2+\frac{3}{2}}{4-2} = \frac{\frac{7}{2}}{2} = \frac{7}{4}$

3. For practice:

1. $\frac{\sin 60^0 + \cos 30^0 - 2\cot 45^0}{\sin 45^0 + \sec 60^0}$ 2. $\frac{\tan 30^0 + \cot 45^0 - \cos ec30^0}{\sec 30^0 + \cos ec60^0}$

3. $\frac{\cos 45^0 - 2\sec 30^0}{2\cos ec45^0 - 3\cot 30^0}$ 4.$\sin 60^0.\cos 30^0 + \sin 30^0.\cos 60^0$

5. $2\tan^2 45^0 + \cos^2 30^0 - \sin^2 60^0$ 6. $\frac{\sec 30^0 + \cos ec30^0}{\cos 45^0}$

7. $\frac{\sin 30^0 + \cos ec30^0}{\cot 45^0}$ 8. $\frac{\sin 30^0 + \tan 45^0 - \cos ec60^0}{\sec 30^0 + \cos 60^0 + \cot 45^0}$

9. $\frac{\sec 30^0 + 2\cos 60^0 - \cot 45^0}{3\tan 45^0 - 2\cos ec60^0}$ 10. $\frac{5\cos^2 60^0 + 4\sec^2 30^0 - \tan^2 45^0}{\sin^2 30^0 + \cos^2 30^0}$

11. $\frac{3\sec 30^0 + 2\cos ec30^0}{3\cos 45^0}$ 12. $\frac{3\sin 60^0 + 2\cos ec30^0}{\tan 45^0 - 2\cot 45^0}$

13. $\frac{4\tan 45^0 - 3\cot 30^0}{3\cos ec45^0 - \sec 45^0}$ 14. $\frac{34\cos 30^0 - \cos 60^0}{2\sin 45^0 - 3\tan 45^0}$

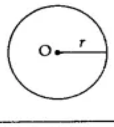
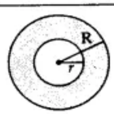
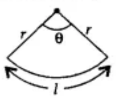
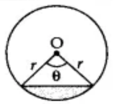
15. $\frac{4\sec^2 45^0 - 3\cos^2 30^0}{2\sin 30^0 + 3\cos ec^2 60^0}$ 16. $\frac{3\cos^2 45^0 - 2\sec^2 30^0}{\cot^2 30^0 - 2\cos ec^2 30^0}$

19. $\frac{4\sin^2 60^0 - 3\tan^2 30^0}{4\cos^2 30^0 - \sec^2 45^0}$ 17. $\frac{2\tan^2 45^0 - 3\sec^2 60^0}{2\cos ec^2 30^0 + 2\cot^2 30^0}$

18. $\frac{4\cos^2 60^0 - 3\tan^2 30^0}{5\sec^2 60^0 + 2\tan 45^0}$ 20. $\sin 60^0.\cos 30^0 - \cos 60^0.\sin 30^0$

Name of the Solid	Curved Surface Area	Total Surface Area	Volume
Cuboid	$2h(l+b)$	$2(lb+bh+hl)$	lbh
Cube	$4a^2$	$6a^2$	a^3
Right Circular Cylinder	$2\pi rh$	$2\pi r(r+h)$	$\pi r^2 h$
Right Circular Cone	πrl	$2\pi r(r+l)$	$\frac{1}{3}\pi r^2 h$
Sphere	–	$4\pi r^2$	$\frac{4}{3}\pi r^2$
Hemisphere	$2\pi r^2$	$3\pi r^2$	$\frac{2}{3}\pi r^2$
Frustum of a Cone	$\pi(r_1+r_2)l$ where $l=\sqrt{h^2+(r_1-r_2)^2}$	$\pi(r_1+r_2)l$ + $\pi r_1^2+\pi r_2^2$	$\frac{1}{3}\pi h(r_1^2+r_2^2+r_1r_2)$

TABLE FOR AREA AND PERIMETER

Figures	Area	Perimeter	
Circle 	πr^2 or $\frac{\pi d^2}{4}$	$2\pi r$ or πd	r : radius d : diameter $\pi = \frac{22}{7}$ or 3.14
Semicircle 	$\frac{\pi r^2}{2}$	$\pi r + 2r$	
Quadrant 	$\frac{\pi r^2}{4}$	$\frac{\pi r}{2} + 2r$	
Ring 	$\pi(R+r)(R-r)$	$2\pi R$ (Outer circumference) $2\pi r$ (Inner circumference)	R : Radius of bigger circle r : Radius of smaller circle
Sector 	(i) $\frac{\theta}{360} \times \pi r^2$ (ii) $\frac{1}{2} lr$	$\frac{\theta}{360} \times 2\pi r + 2r$	r : Radius of circle l : length of arc
Segment 	$\frac{\theta}{360}\pi r^2 - \frac{1}{2}r^2 \sin\theta$	$\frac{\pi r\theta}{180} + 2r\sin\frac{\theta}{2}$	θ : angle subtended by arc at centre

Practice Question Paper-1
Target-45

I. Answer the following. **7X1=7**

1.Find the distance of a point (2, -3) from the origin.

2. Find the 3rd term of AP an= 2n+3.

3.Write the formula to find Volume of cone.

4.Write condition of pair of intersection of pair of linear equation.

5.Write midpoint formula of two co-ordinates.

6.Find cosecθ if sinθ=$\frac{4}{5}$.

7.State Thales Theorem.

II. Answer the following. **5X2=10**

8.Find the sum of A P 1+5+9+ ……upto 20 terms.

9.Draw a line segment AB of length 8 cm and divide it in the ratio of 3:2

10.Solve x+3y=6 and 2x-3y=6.

11.Find the distance between the points (-3, 5)and (3, -3).

12.Solve using quadratic formula $x^2+10x+25=0$.

III. Answer the following. **3X5=15**

13.Prove that, “The two tangents drawn from an external point to a circle are equal”.

14. Draw more than ogive curve for following data.

CI	0-50	50-100	100-150	150-200	200-250	250-300
f	12	18	27	20	17	6

15. Calculate mean, and mode for the following data distribution.

C-I	0-10	10-20	20-30	30-40	40-50
F	6	8	7	3	1

16. Draw a circle of radius 3.5 cm from a point 8 cm away from the center; construct the pair of tangents to the circle. Measure the tangents and write.

17. Find the areas of triangles whose vertices are given below(2, -1) , (3, 2) and (5, -3)

IV. Answer the following. **4X2=8**

18. Solve the following pair of linear equations in two variables by graphical method :x + y = 7 and 3x – y = 1.

19. Construct a triangle of sides 4 cm , 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{2}{5}$ of the corresponding sides of the first triangle.

V. Answer the following. **5X1=5**

20.State and Prove, “Pythagoras theorem”.

Probable date to conduct Date:02/03/2022

Practice Question Paper-2
Target-45

I. Answer the following. **7X1=7**

1.Find the distance of a point (3, 4) from the origin.

2. Find the 3rd term of AP a_n= 3n+1.

3.Write the formula to find Volume of Hemisphere.

4.Write algebraic condition of pair of linear equation for coincident lines.

5.Write section formula to find the coordinates of a point which divides the lime segment joining points internally in the given ratio.

6.Find tan θ if $\cot\theta = \frac{12}{5}$.

7.State Pythagoras s Theorem.

II. Answer the following. **5X2=10**

8. Find the sum of A P1+4+7+…………upto 30 terms.

9.Solve .2x+y=3; x+3y=18.

10. Find the distance between the points (2, 4)and (5, 8).

11.Solve using quadratic formula $3x^2$-5x+2=0.

12. Draw a line segment AB of length 10 cm and divide it in the ratio of 2:3

III. Answer the following. **3X5=15**

13. "The tangent at any point of a circle is perpendicular to the radius drawn at the point of contact".

14. Draw less than ogive curve for following data.

CI	0-100	100-200	200-300	300-400	400-500
F	15	10	17	12	6

15. Calculate median and mode for the following data distribution.

C-I	0-10	10-20	20-30	30-40	40-50
F	6	8	7	3	1

16. Draw a pair of tangents to a circle of radius 4cm, which are inclined at an angle of 120^0.

17. Find the perimeter of triangle whose vertices are (5, 2), (-3, 4) and (2, -5).

IV. Answer the following. **4X2=8**

18. Solve the following pair of linear equations in two variables by graphical method : .2x-y-2=0; x+y=6.

19. Draw a ΔABC with sides AB = 5cm, BC = 4 cm and ∟ABC=60^0 Then construct a triangle whose sides are $\frac{7}{5}$ of the corresponding sides of triangle ABC.

V. Answer the following. **5X1=5**

20.State and Prove, "Thale's theorem".

Probable date to conduct Date:05/03/2022

Practice Question Paper-3
Target-45

I. Answer the following. **6X1=6**

1.Find the distance of a point (3, 0) from the origin.

2. Find the 3rd term of AP a_n= 3n+1.

3.Write the formula to find Volume of frustum of a cone.

4.Write algebraic condition of pair of linear equation for parallel lines.

5.Write the formula to find area of a triangle when coordinates of its vertices are given.

6. Evaluate , tan 48^o x tan 42^o

II. Answer the following. **7X2=14**

8. Find the sum of A P1+4+7+…………upto 30 terms.

9.Solve .2x+y=3; x+3y=18.

10. Find the midpoint of line joining the points (3, 4)and (5, 6).

11.Solve using quadratic formula $2x^2$- 3x = 5.

12. Draw a line segment PQ of length 8 cm and divide it in the ratio of 2:3

13. Find the discriminant of equation $2x^2$-3x-8=0 and also write nature of roots.

14. If a_{12}=35, a_{18}=53 find a_{20}

III. Answer the following. **3X4=12**

12. "The tangent at any point of a circle is perpendicular to the radius drawn at the point of contact".

13. Draw less than ogive curve for following data.

CI	0-10	10-20	20-30	30-40	40-50
F	5	7	3	2	3

14. Calculate mean and median for the following data distribution.

C-I	0-5	5-10	10-15	15-20	20-25
F	6	8	7	3	1

15 Draw a circle of radius 2.5 cm and construct a chord of length 3 cm. and Draw the tangents at the end points of the chord.

IV. Answer the following. **4X2=8**

16. Solve the following pair of linear equations in two variables by graphical method : . **y =2x-2 and y =4x-4**.

17. Construct a triangle ABC with sides AB= 6cm and ∟BAC=50^0 and ∟ABC=60^0. Then construct a triangle whose sides are $1\frac{1}{2}$of the corresponding sides triangle ABC.

V. Answer the following. **5X1=5**

18.State and Prove, Converse of "Pythagoras theorem".

Probable date to conduct Date:09/03/2022

Practice Question Paper-4
Target-45

I. Answer the following. **7X1=7**

1.s first natural number.

II. Answer the following. **6X2=12**

8. Find the sum of first 12 even natural numbers.
9.Solve . 2x+y-6=0 and 6x+2y-4=0.
10. Draw a line segment of length 7cm and divide it in the ratio of 2:1
11.Solve using quadratic formula m^2-8m+10=0.
13. If in an AP is 2,5,8… then find 20^{th} term?
14.If $2x^2$+3+5=0 then find discriminant and write nature of roots

III. Answer the following. **3X4=12**

12. "The tangent at any point of a circle is perpendicular to the radius drawn at the point of contact".
13. Draw ogive curve for following data.

CI	>0	>10	>20	>30	>40
F	20	15	8	5	3

14. Calculate mean and median for the following data distribution.

C-I	0-5	5-10	10-15	15-20	20-25
F	6	8	7	3	1

15 Construct a pair of tangents to a circle of radius 3 cm from a point 6cm away from the circle .

IV. Answer the following. **4X2=8**

16. Solve the following pair of linear equations in two variables by graphical method : x + y =10 ; x – y =2
17. Construct a triangle of sides 4 cm , 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{5}{3}$ of the corresponding sides of the first triangle.

V. Answer the following. **5X1=5**

18. Prove that "The areas of two similar triangles are proportional to the squares of their corresponding side".

Probable date to conduct Date:12/03/202

Practice Question Paper-5
Target-45

I.Answer the following. **7X1=7**

1.What distance of a point P(5, -3) from the X-axis.
2. Find the 10^{th} term of AP in which a_n= 6n+3.
3.Write the formula to find Volume of frustum of a cone.
4. Write condition for pair of lines $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ to be coincide.
5. Write the formula to find length of arc of sector of an angle θ of circle with radius 'r'
6.Find tanθ if sinθ=$\frac{4}{5}$.
7.State S.S.S. criterion for similarity of triangles.

II. Answer the following. **5X2=10**

8.Divide the line segment AB=5.5cm in the ratio 4:3 .
9.Find the sum of A.P. 7+5+3+ ……….. upto 30 terms.
10.Solve 3x+y=7 and 2x-y=5.
11. Find the area of the triangle whose vertices are (4, 2) (-3, 5)and (3, -3).
12.Solve using quadratic formula $2x^2$+5x+10=0.

II. Answer the following. **3X4=12**

13.Prove that, "The two tangents drawn from an external point to a circle are equal".
14. Draw ogive curve for following data.

CI	Less than 50	Less than 100	Less than 150	Less than 200	Less than 250	Less than 300
F	12	30	57	77	94	100

15. Calculate mean, median and mode for the following data distribution.

C-I	0-20	20-40	40-60	60-80	80-100
F	8	10	6	7	4

16. Draw a circle of radius 4 cm from a point 8 cm away from the center; construct the pair of tangents to the circle. Measure the tangents and write.

III. Answer the following. **4X2=8**

17. Solve the following pair of linear equations in two variables by graphical method : 2x + y = 8 and 3x – y = 7.
18. Construct a triangle ABC in which AB=4cm AC=5cm and $\angle B = 60^0$ and then a triangle similar to it whose sides are $\frac{2}{5}$ of the corresponding sides of the first triangle.

IV. Answer the following. **4X2=8**

19.State and Prove, "A.A. criteria for similarity of triangles".

Probable date to conduct Date:16/03/2022

Practice Question Paper-6
Target-45

I.Answer the following. 7X1=7

1.Write the number of solutions that the pair of linear equations $a_1x+b_1y+c_1=0$ and $a_1x+b_1y+c_1=0$ have .

2. Write the formula to find the sum of first 'n' even natural numbers .

3.If $A=30^0$, then find the value of sin3A.

4.Write the coordinates of the point 'P' which divides the line segment joining the points (x_1, y_1) and (x_2, y_2) in the ratio $m_1:m_2$ internally.

5.State Basic proportionality theorem.

6.If the diameter of the circle is 14cm then find the area of its quadrant.

7.Write the formula to find the T.S.A. of hemisphere.

II. Answer the following. 5X2=10

8.Divide the line segment MN=6.3cm in the ratio 5:3 .

9.Find the sum of A.P. 10+6+2+……….+(-98).

10.Solve 4x+3y=17 and 5x-4y=-2.

11. Find the area of triangle whose vertices are (6, 5) (3,2) and (-1, 5).

12.Solve using quadratic formula $4x^2+7x-20=0$.

II. Answer the following. 3X4=12

13.Prove that, "The radius drawn at the point of contact is perpendicular to the tangent".

14. Draw less than ogive curve for following data.

CI	More than 0	More than 10	More than 20	More than 30	More than 40	More than 50
F	50	37	32	25	14	8

15. Calculate mean, median and mode for the following data distribution.

C-I	0-15	15-30	30-45	45-60	60-75
F	8	4	6	9	3

16. Construct two tangents to a circle of radius 4 cm which are inclined at an angle of 75^0.

III. Answer the following. 4X2=8

17. Solve the following pair of linear equations in two variables by graphical method : 3x + y = 2 and 4x – y = 5.

18. Construct a triangle ABC in which AB=4cm $\angle A = 60^0$ and $\angle C = 70^0$ and then a triangle similar to it whose sides are $\frac{2}{5}$ of the corresponding sides of the first triangle

IV. Answer the following. 4X2=8

19. Prove that "The areas of two similar triangles are proportional to squares of their corresponding sides".

Probable date to conduct Date:19/03/2022

Practice Question Paper-7
Target-45

I.Answer the following. 7X1=7

1.Find the distance of a point (2, -3) from the origin.

2. Find the 3rd term of AP $a_n= 2n+3$.

3.Write the formula to find Volume of cone.

4.Write condition of pair of intersection of pair of linear equation.

5.Write midpoint formula of two co-ordinates.

6.Find cosecθ if $\sin\theta=\frac{4}{5}$.

7.State Thales Teorem.

II. Answer the following. 4X2=8

10. Find the sum of A.P. 1+5+9+ ………. upto 20 terms.

11. Solve x+3y=6 and 2x-3y=6.

10. Find the distance between the points (-3, 5)and (3, -3).

11.Solve using quadratic formula $x^2+10x+25=0$.

II. Answer the following. 3X4=12

12.Prove that, "The two tangents drawn from an external point to a circle are equal".

13. Draw more than ogive curve for following data.

CI	0-50	50-100	100-150	150-200	200-250	250-300
f	12	18	27	20	17	6

14. Calculate mean, median and mode for the following data distribution.

C-I	0-10	10-20	20-30	30-40	40-50
F	6	8	7	3	1

15. Draw a circle of radius 3.5 cm from a point 8 cm away from the center; construct the pair of tangents to the circle. Measure the tangents and write.

III. Answer the following. 4X2=8

16. Solve the following pair of linear equations in two variables by graphical method :x + y = 7 and 3x – y = 1.

17. Construct a triangle of sides 4 cm , 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{2}{5}$ of the corresponding sides of the first triangle.

IV. Answer the following. 4X2=8

18.State and Prove, "Pythagoras theorem".

Probable date to conduct Date:22/03/2022

Practice Question Paper-8
Target-45

I.Answer the following. 7X1=7

1.Find the distance of a point (2, -3) from the origin.

2. Find the 3rd term of AP a_n= 2n+3.

3.Write the formula to find Volume of cone.

4. Write condition for pair of lines $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ to be intesect.

5.Write midpoint formula of two co-ordinates.

6.Find cosecθ if sinθ=$\frac{4}{5}$.

7.State Thales Teorem.

II. Answer the following. 5X2=10

8.Divide the line segment AB=8cm in the ratio 3:2 .

9.Find the sum of A.P. 1+5+9+ ……….. upto 20 terms.

10.Solve x+3y=6 and 2x-3y=6.

11. Find the distance between the points (-3, 5)and (3, -3).

12.Solve using quadratic formula $x^2+10x+25=0$.

II. Answer the following. 3X4=12

13.Prove that, "The two tangents drawn from an external point to a circle are equal".

14. Draw more than ogive curve for following data.

CI	0-50	50-100	100-150	150-200	200-250	250-300
F	12	18	27	20	17	6

15. Calculate mean, median and mode for the following data distribution.

C-I	0-10	10-20	20-30	30-40	40-50
F	6	8	7	3	1

16. Draw a circle of radius 3.5 cm from a point 8 cm away from the center; construct the pair of tangents to the circle. Measure the tangents and write.

III. Answer the following. 4X2=8

17. Solve the following pair of linear equations in two variables by graphical method :x + y = 7 and 3x – y = 1.

18. Construct a triangle of sides 4 cm , 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{2}{5}$ of the corresponding sides of the first triangle.

IV. Answer the following. 4X2=8

19.State and Prove, "Pythagoras theorem".

Probable date to conduct Date:25/03/2022

Practice Question Paper-9
Target-45

I.Answer the following. 7X1=7

1.Find the distance of a point (3, 2) from the origin.

2. Find the 5^{th} term of AP in which a_n= 5n-3.

3.Write the formula to find the area of sector of an angle θ of circle with radius 'r'.

4.Write condition for pair of lines $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ to be parallel.

5.State A.S.A. criteria for similarity of triangles.

6.Find cosθ if secθ=$\frac{6}{7}$.

7.Write the formula to find the T.S.A. of cylinder.

II. Answer the following. 5X2=10

8.Divide the line segment PQ=7cm in the ratio 1:2 .

9.Find the sum of A.P. 1+4+7+………+100.

10.Solve 3x+2y=6 and 5x-3y=8.

11. Find the midpoint of the points (-3, 5)and (3, -3).

12.Solve using quadratic formula $x^2+6x-30=0$.

II. Answer the following. 3X4=12

13.Prove that, "The radius drawn at the point of contact is perpendicular to the tangent".

14. Draw less than ogive curve for following data.

CI	0-10	10-20	20-30	30-40	40-50	50-60
F	5	3	4	6	3	4

15. Calculate mean, median and mode for the following data distribution.

C-I	0-5	5-10	10-15	15-20	20-25
F	6	4	7	2	1

16. Construct two tangents to a circle of radius 4 cm which are inclined at an angle of 65^0.

III. Answer the following. 4X2=8

17. Solve the following pair of linear equations in two variables by graphical method : 2x + y = 5 and 3x – y = 5.

18. Construct a triangle of sides 3cm , 4 cm and 5 cm and then a triangle similar to it whose sides are $\frac{3}{2}$ of the corresponding sides of the first triangle.

IV. Answer the following. 4X2=8

19.State and Prove, "Thales theorem".

Probable date to conduct Date:02/04/2022